DOCUMENT RESUME

ED 058 361 UD 012 043

TITLE	An Evaluation of the Corrective Mathematics Services for Disadvantaged Pupils in Non-Public Schools.
INSTITUTION	New York Univ., N.Y. Center for Field Research and School Services.
SPONS AGENCY	New York City Public Schools, Brooklyn, N.Y.
PUB DATE	31 Aug 70
NOTE	55p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Academic Achievement; Changing Attitudes; *Compensatory Education Programs; Disadvantaged Youth; Educational Diagnosis; Elementary School Students; Inner City; *Mathematics Instruction; *Private Schools; *Program Evaluation; Secondary School Students; Self Concept
IDENTIFIERS	Elementary Secondary Education Act Title I; ESEA Title I; *New York City

ABSTRACT

Under Corrective Mathematics Services for Disadvantaged Pupils in Non-Public Regular Day Schools, 1969-1970, funded under ESEA Title I, corrective mathematics services were to be provided by licensed teachers from the New York City Board of Education for approximately 16,100 children from poverty areas who attended 146 non-public regular day schools. The children were to be for participation in the program on the basis of their retardation in mathematics. Corrective services were to be provided as an in-school program during the regular hours of the non-public schools. The objectives of the program were: (1) to raise educational aspirations of pupils selected for the program; (2) to raise the level of mathematical competency; (3) to increase school achievement; (4) to improve children's self-image and school attitude; and, (5) to improve daily attendance. The evaluation objectives were: (1) to examine the degree to which the proposed objectives of the program have been achieved; (2) to examine and appraise the procedures employed in the program to achieve the stated objectives; (3) to obtain some conclusions regarding the viability of the program; and, (4) to present recommendations for improving the effectiveness of the Corrective Mathematics Services Program. (Author/JM)

ED058361

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

AN EVALUATION OF THE CORRECTIVE MATHEMATICS SERVICES FOR DISADVANTAGED PUPILS IN NON-PUBLIC SCHOOLS

Evaluation of a New York City school district educational project funded under Title I of the Elementary and Secondary Education Act of 1965 (PL 89-10), performed under contract with the Board of Education of the City of New York for the 1969-70 school year.

Professor William Zlot
Project Director

Center for Field Research and School Services
School of Education
New York University

UD012043

August, 1970

NEW YORK UNIVERSITY

School of Education
Center for Field Research and School Services
Office of Off-Campus Courses

51 PRESS BUILDING
WASHINGTON SQUARE, NEW YORK, N.Y. 10003
AREA 212 598-2898

August 31, 1970

Dr. Samuel D. McClelland
Acting Director
Bureau of Educational Research
BOARD OF EDUCATION OF THE CITY
OF NEW YORK
110 Livingston Street
Brooklyn, New York 11201

Dear Dr. McClelland:

In fulfillment of the agreement dated February 6, 1970 between the New York City Public Schools and the Center for Field Research and School Services, I am pleased to submit two hundred and fifty copies of the final report, An Evaluation of the Corrective Mathematics Services for Disadvantaged Pupils in Non-Public Schools.

The Bureau of Educational Research and the professional staff of the New York City Public Schools were most cooperative in providing data and facilitating the study in general. Although the objective of the team was to evaluate a project funded under Title I, this report goes beyond this goal. Explicit in this report are recommendations for modifications and improvement of the program. Consequently, this report will serve its purpose best if it is studied and discussed by all who are concerned with education in New York City -- the Board of Education, professional staff, students, parents, lay leaders, and other citizens. To this end, the study team is prepared to assist with the presentation and interpretation of its report. In addition, the study team looks forward to our continued affiliation with the New York City Public Schools.

You may be sure that New York University and its School of Education will maintain a continuing interest in the schools of New York City.

Respectfully submitted,

Arnold Spinner

ARNOLD SPINNER
Director

AS:n

TABLE OF CONTENTS

Chapter		Page
	EXECUTIVE SUMMARY	v
	ACKNOWLEDGMENTS	ix
I	INTRODUCTION	1
	A. The Program	1
	B. Evaluation Objectives	2
	C. Evaluation Procedures	3
II	IMPLEMENTATION OF EVALUATION OBJECTIVE 1	6
	A. The Degree to Which Program Objective 1 Has Been Achieved	6
	B. The Degree to Which Program Objective 2 Has Been Achieved	7
	C. The Degree to Which Program Objective 3 Has Been Achieved	19
	D. The Degree to Which Program Objective 4 Has Been Achieved	20
	E. The Degree to Which Program Objective 5 Has Been Achieved	20
III	IMPLEMENTATION OF EVALUATION OBJECTIVES 2,3 and 4.	22
	A. Evaluation Objective 2	22
	B. Evaluation Objective 3	24
	C. Evaluation Objective 4 (Recommendations)	25
	APPENDICES	30

TABLES

Table		Page
I	Computation Scores – All Grades	10
II	Problem Solving Scores – All Grades	10
III	Combined Computation and Problem Solving Scores – All Grades	10
IV	Scores – Second Grade Only	10
V	Computation Scores – Third and Fourth Grades	11
VI	Problem Solving Scores – Third and Fourth Grade	11
VII	Combined Computation and Problem Solving Scores – For Third and Fourth Grades	11
VIII	Computation Scores – Fifth and Sixth Grades	11
IX	Problem Solving Scores – Fifth and Sixth Grades	12
X	Combined Computation and Problem Solving Scores – Fifth and Sixth Grades	12
XI	Computation Scores – Seventh and Eighth Grades	12
XII	Problem Solving Scores – Seventh and Eighth Grades	13
XIII	Combined Computation and Problem Solving Scores – Seventh and Eighth Grades	13
XIV	Comparison of Schools – Project Students Only – Computation Scores	16
XV	Comparison of Schools – Project Students Only – Problem Solving Scores	17
XVI	Comparison of Schools – Project Students Only – Combined Computation and Problem Solving Scores	18

AN EVALUATION OF CORRECTIVE

MATHEMATICS SERVICES FOR DISADVANTAGED PUPILS

IN NON-PUBLIC REGULAR DAY SCHOOLS 1969-1970

Professor William Zlot, Director

EXECUTIVE SUMMARY

A. Program Objectives

1. To raise educational aspirations of pupils selected for the program.
2. To raise the level of mathematical competency.
3. To increase school achievement.
4. To improve children's self-image and school attitude.
5. To improve average daily attendance.

B. Evaluation Objectives

1. To examine the degree to which the proposed objectives of the Corrective Mathematics Services Program have been achieved:

(a) Evaluation Procedures:

(1) On-site visits to a random sample of 28 schools were conducted.

(2) Anonymous questionnaires were mailed to all project teachers, all principals and two regular classroom teachers in each of the schools being serviced. We received completed forms from approximately two-thirds of the people in each of these three categories.

(3) Pre- and post-test scores on the MAT's were obtained for the students in 30 of the schools who received remedial work during the year. Pre- and post-test scores on the MAT's were obtained for the students in a certain set of 11 schools who were left on

the waiting list. These students constituted a "control" group: to which we compared the gain in achievement of the project students in the 30 schools. This comparison was carried out by computing an F-ratio by the analysis of covariance in each of 16 cases.

(b) Findings: (corresponding to each program objective).

(1) Inasmuch as no provision was made for the administering of appropriate attitude scales for children at the beginning of the program in the fall of 1969, it was not possible for the evaluators to come to a definitive conclusion about the change in the pupils' educational aspirations. We recommend adopting certain of the newer attitude scales which have been recently formulated. Because no appropriate formal instrument for measuring changes in attitude was administered at the beginning of the program, we simply analyzed the responses to two questions on our questionnaire to regular teachers and found what might be interpreted as a modest rise in educational aspirations (in the opinion of these teachers).

(2) Analysis of the covariance confirms that the project students did significantly better than the control group. Moreover, in certain categories, the project students had a mean gain which was somewhat greater than the national norm of mean gains. In general, it appears that the difference in mean gain in achievement is less for problem-solving than for straight computation.

(3) According to our analysis of the responses to two questions on our questionnaire for regular teachers, it appeared that school

achievement in mathematics was somewhat increased by participation in the program.

(4) Again in the absence of any appropriate formal instrument for measuring changes in such things as self-image and school attitude, we resorted to our anonymous questionnaires. According to our analysis of two questions on the questionnaire for regular teachers, self-image seems to have been improved reasonably well but school attitude only improved slightly.

(5) According to the response to the questionnaire for regular teachers, average daily attendance was not greatly improved.

2. To examine and appraise the procedures employed in the Corrective Mathematics Service Program to achieve the stated objectives:

(a) Evaluation Procedures:

(1) On-site visits are described in Part B – 1.

(2) Anonymous questionnaires are described in Part B – 1.

(b) Findings:

(1) Many schools were not assigned teachers in accordance with the school's needs. Certainly the existence of a sizable waiting list in almost all of the schools indicates that an expansion of the program would be required to carry out this procedure satisfactorily. Moreover, it appears that approximately 30 per cent of the schools received less than two days of service per week.

(2) The Corrective Mathematics Program serves as an excellent training ground for the preparation of teachers of small classes of children who need remedial assistance. There were approximately 15 in-service training conferences during the year and we believe

there should be an expansion of such in-service training in accordance with our recommendations in Part C of Chapter III.

(3) An examination of responses to the questionnaire for project teachers indicates that in the opinion of these teachers the instructional materials provided were very useful.

(4) Several schools equipped with math labs were visited. Although the evaluators were quite impressed with what they saw in the classroom, the sample was too small for us to draw any confident conclusion as to the merit of this innovation.

3. To obtain some conclusions regarding the viability of the Corrective Mathematics Services Program:

(a) Evaluation Procedures:

(1) On-site visits are described in Part B – 1.

(2) Anonymous questionnaires are described in Part B – 1.

(3) Statistical analyses are described in Part B – 1.

(b) Findings:

(1) Our statistical results signify that the project did have an effect upon the students.

(2) On the basis of interviews and the analysis of the responses to certain questions on our questionnaires, we found that in some cases the corrective mathematics program has caused disruptions in the normal school day routine.

(3) We recommend that some concerted studies be made to determine ways to minimize the adverse effect of the disruptions.

4. To present recommendations for improving the effectiveness of the Corrective Mathematics Services Program:

Twenty-two such recommendations are presented in Part C of Chapter III.

ACKNOWLEDGMENTS

To Helen Spector, Acting Director of the Office of State and Federally Assisted Programs for the Non-Public Schools and Mrs. Lucille A. Stovall, Co-ordinator of Corrective Mathematics Services, both of the New York City Board of Education for their cooperation and their advice on goals and procedures;

To Miss Joan Raymond, Rabbi Burton Jaffa, Mr. Joseph P. O'Connor and Mr. George Prassas, Title I Liaison Officers at the New York City Board of Education for their help in facilitating our evaluation by enabling us to obtain access to various schools;

To Professors Edward Carroll, Than Porter and Stanley Taback and Miss Judith Jacobs for their diligent work and valuable judgments;

To Professor Than Porter for his expert assistance in computer processing of the data and evaluating the results;

And to Dr. Arnold Spinner and Miss Helen Kelly, Center for Field Research and School Services, School of Education, New York University, for their constant aid, encouragement and advice.

Chapter I

INTRODUCTION

A. The Program

According to the project proposal,[1] corrective mathematics services were to be provided by licensed teachers from the New York City Board of Education for approximately 16,100 children from poverty areas who attended 146 non-public regular day schools. The children were to be selected for participation in the program on the basis of their retardation in mathematics. Those children whose score on a standardized test in mathematics was more than one standard deviation below the grade norm were to be eligible for service. Moreover, children who did not strictly meet this criterion could be recommended for the corrective class by teachers and principals. Corrective services were to be provided as an in-school program during the regular hours of the non-public schools.

The stated objectives of the program were as follows:

1. To raise educational aspirations of pupils selected for the program,
2. To raise the level of mathematical competency,
3. To increase school achievement,
4. To improve children's self-image and school attitude,
5. To improve average daily attendance.

The stated procedures of the program were:

Teachers would be assigned in accordance with school needs. Teachers would be given in-service training. Instructional materials and necessary equipment would be provided. Most children would receive two one-hour sessions per week. Innovative procedures such as math labs, would be used in selected pilot schools.

---

[1]Corrective Mathematics Services for Disadvantaged Pupils in Non-Public Regular Day Schools, 1969-1970. Title I, ESEA Board of Education, City of New York.

The central administrative staff of the program interpreted the figure of 16,100 students as including both the children who were serviced and those who were tested in the fall of 1969 but were left on the waiting list. Approximately 6,000 children were actually serviced by the corrective mathematics program during 1969-70. These children were distributed among 155 schools of various religious denominations. The professional staff included: the Project Coordinator, five field supervisors and 104 teachers. The number of teachers included 21 regularly appointed teachers, 15 regularly assigned substitute teachers and 68 per diem teachers who filled a total of 67.2 teaching positions (a teaching position is that which one teacher fills for five days a week). In general, the remedial sessions were provided in small classes with a maximum of 10 students. The children who were serviced during the school year were distributed by grade level as follows:

Grade	Number of Children
2	179
3	1282
4	1291
5	1245
6	1041
7	570
8	287
9	45
Total	5940

B. Evaluation Objectives

1. To examine the degree to which the proposed objectives of the Corrective Mathematics Services Program have been achieved,

2. To examine and appraise the procedures employed in the Corrective Mathematics Services Program to achieve the stated objectives,

3. To obtain some conclusions regarding the viability of the Corrective Mathematics Services Program,

4. To present recommendations for improving the effectiveness of the Corrective Mathematics Services Program.

This report describes the findings relative to the first evaluation objective in Chapter II ("On the Achievement of Program Objectives"–Evaluation Objective 1), the findings relative to the other three evaluation objectives in Chapter III ("General Observations and Specific Recommendations"– Evaluation Objectives 2, 3 and 4).

C. Evaluation Procedures

1. On-site visits to a random sample of schools were conducted. This random sample consisted of 28 schools selected approximately in proportion to the distribution of the schools by religious denomination. During each visit, the project teacher, the principal, and one or more classroom teachers were interviewed in accordance with the interview forms which are presented in Appendices A, B, and C, respectively. These interviews were valuable because a few pinpointed certain "rough spots" in the program. Knowledge of some of the minor difficulties allowed the evaluators to suggest appropriate remedies.

Moreover, during these visits, evaluators made suggestions pertaining to the use of materials and to teaching techniques.

2. Anonymous questionnaires were mailed to all project teachers, all principals and two regular classroom teachers in each of the schools being serviced. These forms are presented in Appendices D, E, and F.

These questionnaires are "developing instruments" and after administering them, evaluators found that some of the questions failed to give useful information.

We received completed forms from approximately two-thirds of the people in each of the three categories. It was decided to utilize these completed forms in the following fashion:

(a) Questionnaire to Project Teacher (Appendix D): The responses to Question 21 (Suggestions for Improvement) were examined on all of the approximately seventy completed forms. The responses to this question were helpful in formulating some of the recommendations which are presented in Part C of Chapter III. A random sample of 15 of the approximately 70 completed forms were selected and the responses to certain questions were analyzed in the discussion in Appendix D.

(b) Questionnaire to Principals (Appendix E): The responses to Question 8 (Suggestions for Improvement) were examined in all of the approximately 100 completed forms. The responses to this question were also helpful in formulating some of the recommendations which are presented in Part C of Chapter III. We selected a random sample of 15 of the approximately 100 completed forms and analyzed the responses to certain other questions in the discussion in Appendix E.

(c) Questionnaire to Regular Teachers (Appendix F): The responses to Question 5 (relating to student's attitude) were examined on all of the approximately 160 completed forms. The responses to this question were helpful in evaluating the achievement of the program objectives 1, 3, 4, and 5 as stated in the project proposal. In addition, the responses to Question 10 (Suggestions for Improvement) were also examined on all of the approximately 160 completed forms. The responses to this question were also helpful in formulating some of the recommendations which are presented in Part C of Chapter III. We selected a random sample of 15 of the approximately 160 completed forms and analyzed the responses to certain questions in the discussion in Appendix F.

3. Pre- and post-test scores on the MAT's were obtained for the students in 30 of the schools who received remedial work during the year. These 30 schools included the 28 schools in our original random sample of schools which were visited.

Pre- and post-test scores on the MAT's were obtained for the students in a certain set of 11 schools in our random sample who were left on the waiting list because of lack of space. These students constitute a "control group" to which we compared the gain in achievement of the project students in the 30 schools. This comparison was carried out by means of a statistical analysis in which an F ratio was computed by the analysis of covariance in each of 16 cases.

Chapter II describes the findings which were obtained relative to the first evaluation objective – we examine the degree to which the five proposed objectives of the Corrective Mathematics Service Program have been achieved.

Chapter II

IMPLEMENTATION OF EVALUATION OBJECTIVE 1

A. The Degree to which Program Objective 1 has been Achieved

We recall from Part A of Chapter I that Program Objective 1 was to raise educational aspirations of pupils selected for the program. Inasmuch as no provision was made for the administering of appropriate attitude scales for children at the beginning of the program in the fall of 1969, it was not possible for the evaluators to come to a definitive opinion about the change in such attitudes on the part of the pupils. The difficulty in evaluating changes in attitudes in young children is recognized by the evaluators and so we grant that the realism of such an objective may be questioned. Because no formal instrument for measuring changes in attitude was administered at the beginning of the program, we analyzed two questions which were included in the Questionnaire to Regular Teachers (Appendix F). These two questions were parts (c) and (e) of Question 5. We recall that the responses to Question 5 were examined on each of the approximately 160 completed forms.

Question 5 (c) reads as follows: In general, how has the program changed corrective students' attitude toward studying: very much, somewhat, practically none. Weights of 2, 1 and 0 were assigned to the responses "very much," "somewhat" and "practically none," respectively. The mean response of the approximately 160 regular teachers was 0.556. This signifies that in the opinion of these teachers the educational aspirations of the pupils selected for the program as indicated by their change of attitude towards study is about midway between "somewhat" and "practically none." This result is, of course, not a very bright one as far as Program Objective 1 is concerned.

Question 5(e) reads as follows: In general, how has the program changed corrective students' attitude toward volunteering in the classroom: very much, somewhat, and practically none. Again weights of 2, 1 and 0 were assigned to the responses "very much," "somewhat" and "practically none," respectively. This time the mean response of the approximately 160 regular teachers was 0.969. This signifies that in the opinion of these teachers there was, on the average, somewhat of a change in attitude toward volunteering in the classroom. If we take such volunteering to be an indicator of educational aspiration then we might say that Program Objective 1 was reasonably well achieved.

We reiterate that the evaluators recognize the difficulties in trying to evaluate changes in attitude in young children and they recommend adopting certain of the newer attitude scales which have been recently formulated.

B. The Degree to which Program Objective 2 has been Achieved

We recall from Part A of Chapter I that Program Objective 2 was to raise the level of mathematical competency. In order to ascertain the degree of achievement of this objective, a statistical analysis was undertaken in which an F-ratio was computed by an analysis of covariance in each of 16 cases and corresponding probabilities were noted. We now describe the analyses.

In the following comparisons of mathematics achievement we shall refer to "the project sample" and "the non-project sample." By "the project sample" we shall mean the students in 30 of the schools who received remedial work during the year. These 30 schools included the 28 schools in our original random sample of schools which were visited. The scores from the extra 2 schools were sent to us, and as a result of inspecting these scores, we saw no reason to discard them. By "the non-project sample" we shall mean the students who were left on the waiting list in 11 schools of our original sample of 28 for which we were able to obtain the needed data in sufficient time to conduct our analyses. Since it appears that

the scorers arbitrarily chose to mark the tests from these particular 11 schools first, no variables pertinent to our study were used to select these 11 schools. Hence, that this sample of 11 is free of any relevant bias.

Comparisons were first made of the mathematics achievement of the project students and the non-project students on the Metropolitan Achievement Tests (MAT's). The thirteen tables in which these results appear are displayed immediately after the discussion in the following several paragraphs.

First, an analysis was made to assess the effect of the project upon computation ability and this analysis is summarized in Table I. Then the same analysis was performed for problem-solving ability and then for general mathematical achievement measured by the average of computation ability and problem-solving ability. The latter two analyses are summarized in Tables II and III.

To ascertain whether the project had different effects at different grade levels, the above three analyses were repeated for four grade levels. First, the effect of the project on general mathematical achievement was analyzed for second graders and is summarized in Table XV. For second graders, only one analysis was made because the Metropolitan Achievement Test at that level gives only one score. Then, all three analyses were performed for third and fourth graders and summarized in Tables V, VI, and VII. Similar analyses were made for fifth and sixth graders and are summarized in Tables VIII, IX, and X. Finally, such analyses were made for seventh and eighth graders and are summarized in Tables XI, XII, and XIII.

To determine the necessary probabilities, F ratios were computed and then the probability associated with the F ratio was computed. The F ratio was computed with a rather simple, one-time-use computer program written by Than R. Porter for the Control Data Corporation 6600 located at the CEIR Computing Center at 1180 Avenue of the Americas, and the associated probabilities were computed by a program written by Dr. Nathan Jaspen of New York University and were

computed on the same computer. The F ratios probabilities, and other statistics are given in the following thirteen tables.

From the following thirteen tables it can be seen that most of the probabilities associated with the F ratios are extremely low. In fact, some of them are so small that they appear in the table as zero when rounded off to eight decimal places. Of course, the probability cannot actually be zero since there is always some slight chance that almost any samples, no matter how extreme, could have been drawn randomly from a single population. However, the probabilities that appear as zero in the table are really so small that, for all practical purposes, they might as well be considered to be zero. This signifies that one can be 100 per cent confident that the two samples did not come from a common population in such cases. This implies that the project did have some effect upon the students. It may be seen that, for the second grade (Table IV) the probability is about five per cent. This means that there is a five per cent chance that the difference between the second grade samples just happened by chance and that the project didn't really produce favorable results. However, even five per cent is small enough that it is customary to reject the assertion that the two samples came from the same population. It may be the only reason that this probability is considerably greater than the other twelve is that the sample sizes for grade two are extremely small in this case. If there had been more second graders, it may very well be that the probability for the second grade would have been just as extremely small as in the other cases. Another probability that is relatively large is that for problem-solving for seventh and eighth grades (Table XII). However, as that probability is only about 1.4 per cent, it is also small enough to give a very high level of confidence that the project really did improve the problem-solving ability of the seventh and eighth grades. Thus, in general, the evidence overwhelmingly supports the assertion that the project did indeed improve the mathematics achievement of the project students.

Table I

COMPUTATION SCORES – ALL GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	261	.484	.905	889.873	107.248	179.57638	.00000000
Project	1231	1.190	.742				

Table II

PROBLEM-SOLVING SCORES – ALL GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	261	.656	1.030	947.323	10.445	16.42844	.00019083
Project	1231	.876	.739				

Table III

COMBINED COMPUTATION AND PROBLEM-SOLVING SCORES – ALL GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	261	.570	.844	667.124	46.158	103.09266	.00000000
Project	1231	1.033	.626				

Table IV

SCORES – SECOND GRADE ONLY

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	32	.719	.448	6.661	.767	4.03221	.04964475
Project	5	1.140	.336				

Table V

COMPUTATION SCORES FOR THIRD AND FOURTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	50	.558	.753	236.346	26.214	62.77786	.00000011
Project	518	1.316	.635				

Table VI

PROBLEM-SOLVING SCORES FOR THIRD AND FOURTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	50	.462	.670	198.135	9.576	27.35584	.00001283
Project	518	.920	.584				

Table VII

COMBINED COMPUTATION AND PROBLEM-SOLVING SCORE FOR THIRD AND FOURTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	50	.510	.626	146.945	16.870	64.97815	.00000009
Project	518	1.118	.497				

Table VIII

COMPUTATION SCORES FOR FIFTH AND SIXTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	61	.179	.780	252.450	33.388	71.41913	.00000005
Project	481	.964	.671				

Table IX

PROBLEM-SOLVING SCORES FOR FIFTH AND SIXTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	61	.280	.983	306.878	7.773	13.67753	.00049529
Project	481	.659	.720				

Table X

COMBINED COMPUTATION AND PROBLEM-SOLVING SCORES FOR FIFTH AND SIXTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	61	.230	.679	198.632	18.345	49.87318	.00000041
Project	481	.812	.597				

Table XI

COMPUTATION SCORES FOR SEVENTH AND EIGHTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Between	F Ratio	Probability
Non-Project	114	.754	1.060	328.512	32.326	33.35821	.00000454
Project	227	1.407	.944				

Table XII

PROBLEM-SOLVING SCORES FOR SEVENTH AND EIGHTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Sums of Squares Between	F Ratio	Probability
Non-Project	114	.936	1.219	326.173	6.442	6.02953	.01391360
Project	227	1.227	.927				

Table XIII

COMBINED COMPUTATION AND PROBLEM-SOLVING SCORES FOR SEVENTH AND EIGHTH GRADES

	Group Size	Group Mean Gain	Standard Deviation	Sums of Squares Within	Sums of Squares Between	F Ratio	Probability
Non-Project	114	.845	1.025	255.008	16.907	22.47584	.00004033
Project	227	1.317	.777				

Now that it has been established that the project did improve the students' mathematics achievement in each of the thirteen tables, it remains to be investigated how much the achievement was improved. This is indicated by the mean gains of the two groups in each of the thirteen tables. An examination of the mean gains for the two groups in each table shows that, roughly speaking, the mean gains for the project students are at least double the mean gains for the non-project students in eight of the thirteen tables. In some cases, such as for the computation scores for fifth and sixth grades (Table VIII) and for the combined scores for fifth and sixth grades (Table X), the mean gain for the project group is considerably more than double the mean gain for the non-project group. It may be noted that, for the problem-solving scores for all grades (Table II), the mean gain for the project group, although it is greater than the mean gain for the non-project group, is not strikingly greater, since it is only about 1.3 times as great. In fact, in general, it appears that the difference in mean gain in achievement is less for problem-solving than for straight computation. That is, the project apparently improved computation skills more than it improved problem-solving ability. This may indicate a need for a shift of emphasis in the project teaching unless it is deemed that the computational skills are more important than problem-solving ability.

Since the MAT's are standardized tests–standardized on a national population–not only can a comparison be made of the project students with the non-project students, but a comparison can also be made of the project students with other students in the country. The mean scores in all of the tables are given in units of years of gain in achievement. Since the students were taught for one year, the mean gain at each level for the nation as a whole must be one year. The mean gains for the project group are, in eight of the thirteen tables, somewhat more than one year, which signifies that the project students were somewhat above the national average in those eight categories.

We now consider another type of analysis which was made.

In Tables XIV, XV and XVI which follow, we consider our three comparisons for the project students only and we compare the 30 schools with one another.

It may be seen that the probabilities associated with the F ratios in the three following tables are so low that when rounded off to eight decimal places, they are all zero. This signifies that there is, practically speaking, 100 per cent certainty that the schools did not all come from the same population. In particular, an examination of Table XV shows that the mean gain in problem-solving of the project group in some schools was actually lower than the mean gain in problem-solving of all of the non-project students (Table II). Thus, the schools in Table XV with mean gains of .577, .632, .595, .616, .574, .418, .518 and .557 were under the mean gain in problem-solving of all non-project students which is .656 as given in Table II.

One may only conjecture why, as indicated in Tables XIV, XV and XVI, some of the schools have rather low mean gains for project students and others rather high ones. It is possible that the difference between schools may have been caused by differences in the project teachers. Since the mean gain in the combined score for all project students was reasonably good, namely 1.033 (Table III), it is evident that, in general, the project teachers are reasonably good. However, it appears that the method of selecting the project teachers may need improvement for while most of the teachers chosen were good, some were extremely poor. This suggests the need, not for higher standards for choosing the project teachers, but for more reliable methods. There may also be irregular supervision of the project teachers in some cases and as a result, some project teachers are doing an extremely good job while others are doing a rather poor one.

Table XIV

COMPARISON OF SCHOOLS
PROJECT STUDENTS ONLY
COMPUTATION SCORES

Group Size	Group Mean Gain	Standard Deviation
23	1.874	.742
42	1.464	.690
20	.985	.809
61	.711	.686
39	1.082	.727
57	1.133	.827
41	1.093	.659
21	.890	.545
17	1.629	1.264
61	1.230	.664
40	1.120	.790
58	.905	.675
47	1.121	.603
19	.942	.674
8	1.875	.462
35	1.114	.650
56	1.820	1.063
37	1.641	.661
28	1.582	.428
70	1.017	.727
36	.911	.611
23	1.004	.524
57	1.047	.521
40	1.040	.602
38	1.226	.795
38	1.061	.641
98	1.320	.581
30	.777	.328
70	1.549	.587
21	.905	.651

571.499 = sum of squares within groups
1848.451 = sum of squares between groups
133.94845 = the F ratio
.00000000 = the probability

Table XV

COMPARISON OF SCHOOLS
PROJECT STUDENTS ONLY
PROBLEM-SOLVING SCORES

Group Size	Group Mean Gain	Standard Deviation
23	1.461	.912
42	1.398	.556
20	.690	.664
61	.713	.722
39	.577	.594
57	.891	.767
41	.632	.582
21	.595	.568
17	.994	1.062
61	1.159	.761
40	.735	.700
58	.616	.679
47	.868	.545
19	.574	.593
8	2.237	.697
35	.983	.970
56	1.414	.897
37	1.368	.697
28	.936	.523
70	.794	.727
36	.772	.781
23	.952	.423
57	.418	.549
40	.812	.658
38	.845	.824
38	.518	.501
98	.833	.604
30	.557	.648
70	1.041	.467
21	.929	.861

567.097 = sum of squares within groups
1048.733 = sum of squares between groups
76.58656 = the F ratio
.00000000 = the probability

Table XVI

COMPARISON OF SCHOOLS
PROJECT STUDENTS ONLY
COMBINED SCORES

Group Size	Group Mean Gain	Standard Deviation
23	1.667	.725
42	1.431	.470
20	.837	.542
61	.712	.607
39	.829	.531
57	1.012	.692
41	.862	.545
21	.743	.429
17	1.312	.809
61	1.194	.647
40	.927	.645
58	.760	.554
47	.995	.463
19	.758	.453
8	2.056	.482
35	1.049	.657
56	1.617	.833
37	1.504	.563
28	1.259	.421
70	.906	.627
36	.842	.619
23	.978	.386
57	.732	.452
40	.926	.500
38	1.036	.667
38	.789	.442
98	1.077	.457
30	.667	.350
70	1.295	.402
21	.917	.694

388.375 = sum of squares within groups
93.522 = sum of squares between groups
9.97260 = the F ratio
.00000000 = the probability

C. The Degree to which Program Objective 3 has been Achieved

We recall from Part A of Chapter I that Objective 3 was to increase school achievement. The evaluators interpreted school achievement to be school achievement in mathematics. The evaluators appealed to two questions which were included in the questionnaire to regular teachers (Appendix F) to help measure the degree to which Objective 3 has been achieved. These two questions were Part (a) of Question 2 and Question 4. The responses to these two questions were obtained from the random sample of 15 forms of the approximately 160 completed forms.

Question 2(a) reads as follows: In general, how much improvement have you noticed in the mathematics achievement of those students who have participated in the corrective program?: Very much, some, practically none. Weights of 2, 1 and 0 were assigned to the responses, "very much," "somewhat," and "practically none," respectively. The mean response of the 15 regular teachers was 1.00. Thus, in the opinion of these teachers, the school achievement in mathematics was somewhat increased.

Question 4 reads as follows: How would you compare the improvement in mathematics achievement of the children in the corrective program to that of the children in your class who are waiting to be assigned to the corrective class?: Corrective children much more, corrective children somewhat more and there are no differences. Weights of 2, 1 and 0 were assigned to the responses "much more," "somewhat more," and "no," respectively. The mean response of the 15 regular teachers was 0.92. Thus, in the opinion of these teachers, corrective children improved somewhat more in mathematics achievement than did those on the waiting list.

D. The Degree to which Program Objective 4 has been Achieved

We recall from Part A of Chapter I that Objective 4 was to improve the children's self-image and school attitude. The evaluators appealed to two questions which were included in the questionnaire to regular teachers (Appendix F) to help measure the degree to which Objective 4 has been achieved. These two questions were parts (f) and (b) of Question 5. We recall that the responses to Question 5 were examined on each of the approximately 160 completed forms.

Question 5(f) reads as follows: In general, how has the program changed corrective students' attitude toward himself: very much, somewhat, practically none. Again, weights of 2, 1 and 0 were assigned to the responses "very much," "somewhat," and "practically none," respectively. The mean response of the approximately 160 regular teachers was 1.11. This signifies that in the opinion of these teachers there has been some reasonable improvement in the children's self-image.

Question 5(b) reads as follows: In general, how has the program changed corrective students' attitude toward school in general: very much, somewhat, and practically none. Again, weights of 2, 1 and 0 were assigned to the responses "very much," "somewhat" and "practically none," respectively. The mean response of the approximately 160 regular teachers was 0.645. This signifies that in the opinion of these teachers, there has been a rather small improvement in school attitude.

E. The Degree to which Program Objective 5 has been Achieved

We recall from Part A of Chapter I that Objective 5 was to improve average daily attendance. The evaluators reported to part (d) of Question 5 in the questionnaire to Regular Teachers (Appendix F) to help measure the degree to which Objective 5 has been achieved. The responses to this question were examined on each of approximately 160 completed forms.

Question 5(d) reads as follows: In general, how has the program changed corrective students' attitude toward attendance: very much, somewhat, practically none. Again, the weights of 2, 1 and 0 were assigned to responses "very much," "somewhat" and "practically none," respectively. The mean response of the approximately 160 teachers was 0.448. This signifies, and, presumably, we are now not dealing with a subjective opinion, that the average daily attendance was not improved very much.

Chapter III describes the findings which were obtained relative to the last three evaluation objectives which were given in Part B of Chapter I.

Chapter III

IMPLEMENTATION OF EVALUATION OBJECTIVES 2, 3 AND 4

A. Evaluation Objective 2

We recall from Part B of Chapter I that Evaluation Objective 2 was to examine and appraise the procedures employed in the Corrective Mathematics Services Program to achieve the stated objectives.

One of the procedures employed in the program involved assigning of teachers in accordance with school needs. Certainly, the existence of a sizable waiting list in almost all of the schools indicates that an expansion of the program would be required in order to carry out this procedure satisfactorily. Moreover, the fact that nine schools out of our original random sample of 28 schools received less than two days of service also indicates that an expansion of the program would be required in order to carry out this procedure successfully. We say this because we feel that each school should be serviced at least two full days a week since the occurrence of many school holidays makes this amount of service quite necessary in most cases.

Another procedure employed in the program involved providing of teachers with in-service training. We concur with the project coordinator when she says that the Corrective Mathematics Services Program serves as an excellent training ground for the preparation of teachers of small classes of children who need remedial assistance. We believe that the in-service training aspect of the program should be expanded so that the Corrective Mathematics Services Program can offer the New York City metropolitan area an even greater supply of well-trained specialists than it has until now. There were 15 in-service training conferences during the year, four of which were held by individual supervisors with their teachers. A specific

recommendation concerning in-service training is given in our recommendations which appear in Part D of this chapter. We draw attention to the discussion in Appendix D of Question 2 on the Questionnaire to Project Teachers since it relates to the training experiences that have been offered to the project teachers.

Another procedure employed in the program involved providing instructional materials and necessary equipment. We draw attention to the responses of a random sample of 15 project teachers to question 11(a) on the Questionnaire to Project Teachers (Appendix D). This question reads: How useful do you find the materials which are provided for your classroom?: very, somewhat, and slightly, or not at all. Weights of 2, 1 and 0 were assigned to the responses "very," "somewhat," and "slightly," respectively. The mean response of the 15 project teachers was 1.9. This signifies that in the opinion of these teachers the materials provided were very useful.

Another procedure employed in the program involved providing most children with two one-hour sessions per week. As we indicated at the beginning of this chapter, nine schools out of our original random sample of 28 received less than two days of service and this indicates that a great number of children are not serviced two hours per week.

Another procedure which was to be employed according to the project proposal was that innovations such as math labs would be used in selected pilot schools. Our understanding is that math labs have been functioning since the Spring of 1969 in four schools. Three of these four were visited by members of the evaluation team. Moreover, the mean gains on the MAT's in these three schools were examined. Although the evaluators were quite impressed with what they saw in the classroom, the sample was too small for us to draw any confident conclusion. We recommend that math labs be installed in more schools in the future. The children should be given every opportunity both in schools with math

labs and in those which are not so equipped to work with models and materials of various kinds.

In two of the schools in our random sample of 28, each child received five days of service per week. Again in this case, the sample was too small for us to draw any confident conclusions.

B. Evaluation Objective 3

We recall from Part B of Chapter I that Evaluation Objective 3 was to obtain some conclusions regarding the viability of the Corrective Mathematics Services Program.

While the statistical results indicated in Part B of Chapter 2 signify that the project did have an effect upon the students, the disruptions of the normal school day routine caused by the Corrective Mathematics Services Program have continued to plague many regular classroom teachers and principals. For example, consider the responses to questions 3 and 7 on the Questionnaire to Regular Teachers (Appendix F). We recall that the responses of a random sample of 15 regular teachers were examined. Question 3 read as follows: To what extent, if any, do the children miss their regular mathematics lesson in order to attend the corrective mathematics class?: Great, some, practically no. Weights of 2, 1 and 0 were assigned to the responses "great," "some" and "practically no," respectively. The mean response of the 15 regular teachers was 0.8 which signifies that to some sizable extent the children who attend the corrective mathematics class are losing what may be valuable experience with the mathematics of their own grade.

Question 7 had three parts to it. Question 7(a) reads: In general, does the student's lost time in the regular classroom create any problems? For him?: Yes or no. 78.5% of the 15 regular teachers who responded said yes and 21.5% said no. Thus, in the opinion of these teachers the child's education is disrupted and problems are created as a result of his attendance in the Corrective Mathematics

Class. Question 7(b) reads: In general, does the students' lost time in the regular classroom create any problems? For the class?: Yes or No. Fifty per cent of the 15 regular teachers who responded said yes and 50 per cent said no. Finally, question 7(c) reads: In general, does the students' lost time in the regular classroom create any problems? For you?: Yes or No. We found that 86 per cent of the 15 teachers responded yes to this question and 14 per cent no. Thus, at least in the opinion of these 15 respondent teachers, the disruptions caused by the existence of the Corrective Mathematics Program have an adverse effect upon the normal routine of the school day.

The fact that many children missed their regular mathematics lesson to attend the Corrective Class is confirmed by an examination of the responses to Question 2 on the questionnaire to Principals (Appendix E). Question 2 reads: To what extent, if any, do the children miss their regular mathematics lesson in order to attend the corrective mathematics class?: Great, some, practically no. Weights of 2, 1 and 0 were assigned to responses "great," "some" and "practically no," respectively. The mean response of the random sample of 15 principals was 1.13.

We recommend that some concerted studies be made to determine ways to minimize the adverse effect of the disruptions which often accompany the Corrective Mathematics Program. On the basis of the results of our evaluation we feel that the Corrective Mathematics Program is sufficiently viable to warrant its continuation and even its expansion.

C. Evaluation Objective 4 (Recommendations)

We recall from Part B of Chapter I that evaluation Objective 4 was to present recommendations for improving the effectiveness of the Corrective Mathematics Program.

Some of the ideas contained in the following recommendations have been in effect for at least a year in various schools involved in the Corrective Mathematics

Program. We hope that the ideas embodied in our recommendations will become widely adopted.

1. Communication and Information

(a) In September, an orientation session should be held in each district to make the aims and methods of the program clear to interested parties such as parents, principals, regular teachers and guidance counsellors, and Title I supervisors and/or coordinator. Of course, the advice of these interested parties should be solicited.

(b) Each parent of a child in the program should be informed when the project teacher is free during the week so that meetings between them might be arranged periodically to discuss the child's progress.

(c) Frequent informal contacts between the project teacher and the regular staff should be encouraged. At such meetings, ideas concerning the remedial work needed by individual children could be discussed.

(d) If there is a corrective reading teacher in the school, it might be fruitful on a pilot basis for the mathematics teacher to contact him and discuss the progress of those children, if any, who are receiving help in both mathematics and reading. Particular attention might be paid to techniques for analyzing and solving verbal problems.

2. Supervisors

(a) The supervisors should be familiar with teaching techniques suitable for small remedial classes. Perhaps they should be required to attend several workshops in September which specifically consider such techniques.

(b) In general, a supervisor should announce his visits in advance. Indeed, every effort should be made to insure that such visits are as profitable as possible to the project teacher. These visits should be regarded, in general, as a medium for providing assistance rather than a means for facilitating investigation.

(c) When the supervisor is present in the classroom, he should not intrude into the project teacher's development for this can undermine the teacher's relationship with the children. Time should be set aside after such a visit so that the supervisor and the project teacher can consider problems and ideas of mutual concern.

(d) In the beginning of the year the project teacher should be apprised of certain specific learning difficulties common to most children at each grade level.

(e) Supervisors should be advised that it might be better to supervise an experienced project teacher somewhat differently from a new one. For example, differentiation should be made in the number and length of visits, in kinds of lesson plans to be made and the suggestions which are made. The procedure of sending inexperienced teachers to observe experienced ones should be expanded.

3. Conduct of Lesson

(a) The project teacher should be encouraged to be flexible in his conduct of the session. For example, by experimenting, he might find that certain children work better individually, while others benefit from working in small groups of two, three or four. Such "partitioning" of the corrective class can facilitate the handling of individual difficulties and provide each child with the opportunity of working at his own level. More emphasis should be placed upon individual and small group instruction.

(b) The project teacher should be encouraged to make lesson plans for guiding his development of a lesson. However, such a plan should be adjusted and/or adapted to the specific needs of the children as they become evident.

(c) Perhaps a 45-minute remedial class is more desirable than a 60-minute session. There are two major reasons for this point of view. First, most children, particularly younger ones, find it difficult to concentrate upon one

subject for a whole hour. Secondly, according to many non-public school administrators, a 45-minute class would be more compatible with the schedule in the non-public school and, hence, would not lead to certain disruptions and programming difficulties which the one hour class often causes.

(d) If possible, the children should be given reasonable homework assignments such as the construction of models to help provide some continuity to the corrective class development. Perhaps the assignment ought to be signed by a parent or guardian.

(e) In order to remove any stigma that might be attached to attendance at the corrective class, the administrators of the non-public schools should carefully explain to the parents and regular teachers that participation in the corrective mathematics program is an opportunity and a privilege, not a punishment.

4. Large Group Meetings at the Board of Education

(a) Project teachers should be encouraged to submit topics in advance to be discussed at these meetings.

(b) Perhaps part of each meeting could be organized around several small sections, each concentrating upon some particular item related to the corrective mathematics program. Each project teacher could attend a section of his choice. The discussion leader for each of these sections would be a person who was conversant with the particular aspect of the program under consideration. For example, sections might be organized by grade level and/or by mathematical topic. In such a section an experienced teacher might present a "model" lesson on a specific topic and then entertain pertinent questions. The corrective mathematics program should provide for making space available for such sessions.

5. Admission and Dismissal

(a) Some intermediate testing program could be provided at the end of January to determine whether any pupils have made sufficient progress to be released from the corrective mathematics program.

6. General Considerations

(a) Children who are between one and two years behind (though they are not one standard deviation below their grade norm) should also be offered remedial help. Such children have a reasonably good chance for success and could move in and out of the program at a much faster rate than now exists.

(b) Where possible and seemingly desirable, bilingual project teachers should be obtained for the pupils and bilingual consultants obtained for the project teachers. This personnel could help win the support of and give assistance to many parents who would otherwise be reluctant to have their children enter the corrective program.

(c) Each school should be programmed to receive a minimum of two days of service per week.

(d) The corrective mathematics program should provide for an in-service course for new project teachers and those experienced teachers who desire to attend, covering the following topics:

(i) The construction, selection and use of materials,

(ii) Techniques for remedial teaching of mathematics,

(iii) Techniques for dealing with the low achiever and/or slower learner,

(iv) Techniques for small group instruction.

(e) Concerted studies should be made to determine ways to minimize the adverse effect of the disruptions of the normal routine of the school day which often accompany the Corrective Mathematics Program.

APPENDICES

APPENDIX A

1969–1970

TITLE I CORRECTIVE PROGRAMS IN THE NON-PUBLIC SCHOOLS GUIDELINES FOR INTERVIEWS WITH PROJECT TEACHERS CORRECTIVE MATHEMATICS PROGRAM

School Teacher's Name

Date No. of Pupils in Corrective Class Grade Observer

1. Educational background of project teacher:

   a. College(s) Degree(s) Date(s) Major(s)

   b. List collegiate courses in mathematics and mathematics pedagogy which you have taken within the last five years.

   c. Which of the courses listed in part (b) do you think have been the most helpful to you in your work in the corrective mathematics program? (list no more than five).

2. Teaching experience of project teacher:

   Grade(s) Subject(s) taught No. of years

3. On what basis were students chosen for the corrective program?

4. In retrospect, what additional or alternative criteria and procedures might be used to choose students for the program? Please give your reasons.

5. Additional comments that might bear upon this evaluation.

APPENDIX B

1969–1970

TITLE I CORRECTIVE PROGRAMS IN THE NON-PUBLIC SCHOOLS
GUIDELINES FOR INTERVIEWS WITH PRINCIPALS
CORRECTIVE MATHEMATICS PROGRAM

School

Principal's Name

Date

Observer

1. On what basis were students chosen for the corrective program?

2. In retrospect, what additional or alternative criteria and procedures might be used to choose students for the program? Please give your reasons.

3. In what ways do you believe that coordinators and supervisors can be most effective in helping the project teacher to conduct the program in your school?

4. Additional comments that might bear upon this evaluation.

APPENDIX C

1969–1970

TITLE I CORRECTIVE PROGRAMS IN THE NON-PUBLIC SCHOOLS GUIDELINES FOR INTERVIEWS WITH REGULAR CLASSROOM TEACHERS CORRECTIVE MATHEMATICS PROGRAM

School Teacher's Name

Date No. of Your Pupils in Program Grade Observer

1. On what basis were students chosen for the corrective program?

2. In retrospect, what additional or alternative criteria and procedures might be used to choose students for the program? Please give your reasons.

3. To what extent do your students miss regular academic work in order to attend the corrective mathematics class?

4. What kind of contact have you with the project teacher?

5. How are parents told about their child's participation in the corrective mathematics program?

6. Additional comments that might bear upon this evaluation.

APPENDIX D

1969–1970

TITLE I CORRECTIVE PROGRAM IN THE NON-PUBLIC SCHOOLS
QUESTIONNAIRE TO PROJECT TEACHER
CORRECTIVE MATHEMATICS PROGRAM

Date No. of pupils in corrective class Grade

PLEASE RESPOND ANONYMOUSLY

1. For how many years, excluding the present, have you taught in the corrective mathematics program?

2. (a) How would you rate the training experiences you received since entering the program?

	number attended	very helpful	helpful	little or no help
Pre-training orientation meetings				
Weekly in-service sessions with supervisors				
Sessions on job with supervisors				
Meetings at Board with coordinator				
Observations you make of other teachers in program				
Observations of you by supervisor				

(b) Which two of the foregoing experiences have you found to be the most valuable? Please list in order of value.

3. If you attended the pre-training orientation meetings at the New York City Board of Education at the beginning of the current academic year, please make specific recommendations for their improvement, if any.

4. If you usually attend weekly in-service sessions, please make specific recommendations for their improvement, if any.

5. If you usually attend the large group meetings at the board office, please make specific recommendations for their improvement, if any.

6. Suppose you were asked to design a one semester course which would be required of corrective mathematics teachers at your grade level. List some of the topics, both mathematical and non-mathematical, which you would include.

7. How often do you teach material that is closely related to that which is being currently taught in the regular class?

   Often Occasionally Rarely

8. Have you noticed changes in the children's

   (a) attitude toward mathematics? Yes No
   What kind of change?

   (b) achievement in mathematics? Yes No
   What kind of change?

9. What kind of contact have the parents had with the program? (Check each response that applies.)

   a. Two or more letters or descriptive information bulletins sent to home.
   b. Two or more parents' group meetings pertaining to program.
   c. Personal interviews with project teacher.

10. (a) How effective do you think this contact with parents has been?

    Very Somewhat Slightly or not at all

    (b) Give your estimate of general parents' reaction to the corrective mathematics program.

    Enthusiastic Noncommital

    Apparently pleased Dissatisfied

11. (a) How useful do you find the materials which are provided for your classroom?

    Very Somewhat Slightly or not at all

    (b) Please give any suggestions you have for additional materials.

12. How would you rate the facilities provided for your corrective class?

    Satisfactory Unsatisfactory

13. Answer the following questions if you have an aide assigned to you.

    (a) How effective is the aide?

    Very Somewhat Slightly or not at all

    (b) In what ways do you believe that an aide can be most helpful to a project teacher?

14. (a) What is the method for dismissing students from the corrective program?

    (b) Is the method for dismissing students satisfactory to you?

    Yes No

    (c) Give your suggestions for alternative dismissal methods.

15. (a) How often have you been visited by a supervisor?

    (b) How would you rate these contacts?

    Very helpful Helpful Little or no help

    (c) Please suggest how these contacts could have been made more helpful.

16. (a) What percentage of the students who started with you at the beginning of this academic year still attend your corrective classes?

    (b) Approximately how many children are on a "waiting list" to enter your corrective class?

17. (a) How successful do you believe you have been as a corrective teacher?

    Very Somewhat Not very

    (b) What do you consider to be the major reasons for any lack of success you may have experienced?

18. (a) How well do you feel you have been received by the regular classroom teachers?

    Very well Reasonably well Not very well

    (b) If your answer in (a) is "not very well," please suggest ways which can help foster good relations between the project teacher and the regular classroom teachers.

19. (a) How well do you feel you have been received by the school principal?

    Very well Reasonably well Not very well

    (b) If your answer is "not very well," please suggest ways which can help foster good relations between the project teacher and the principal.

20. The atmosphere in a corrective mathematics classroom may tend to be more "permissive" than that in the regular classroom. Please indicate if this has been your experience, and if so, has this fact tended to strain relations between you and the regular staff and administration?

21. As a professional educator, please give a general evaluation of the corrective mathematics program and your suggestions for its improvement.

DISCUSSION OF QUESTIONNAIRE TO PROJECT TEACHERS

We now present an analysis of the responses to certain questions on the questionnaire for Project Teachers which were given to a random sample of 15 completed forms. We shall not analyze questions which call for suggestions on the part of the project teachers because many of the suggestions which appeared on the approximately 70 completed forms have been incorporated into our recommendations in Part C of Chapter III.

Question 2(a): We list the six training experiences given in this question and alongside of each we give the mean number attended. We assigned weights of 2, 1 and 0 to the responses "very helpful," "helpful" and "little or no help," respectively. Beside the mean number of training experiences attended, we give the mean response to this question.

Training Experience	Mean number Attended	Mean Rating
1. Pre-training orientation meetings	4.2	1.8
2. Weekly in-service sessions with supervisors	0.0	1.4
3. Sessions on job with supervisors	4.6	1.6
4. Meetings at Board with Coordinator	5.6	1.6
5. Observations you make of other teachers in program	0.4	1.7
6. Observations of you by supervisors	6.3	1.5

Question 2(b): The 15 respondents gave the following overall ranking (from most preferred to least) to these six training experiences: 3, 1, 5, 4, 6, 2.

Question 7: Assigning the weights 2, 1 and 0 to the responses "often," "occasionally" and "rarely" the mean response was 1.1.

Question 8(a): 93.3 per cent said yes.

Question 8(b): All said yes.

Question 9(a): 15.4 per cent checked this item.

Question 9(b): Eight per cent checked this item.

Question 9(c): 61.5 per cent checked this item.

Question 10(a): Assigning the weights 2, 1 and 0 to "very," "somewhat" and "slightly or not at all," respectively, we found that the mean response was 1.3.

Question 10(b): Assigning the weights 3, 2, 1 and 0 to the responses "enthusiastic," "pleased," "non-commital" and "dissatisfied," respectively, the mean response was 2.2.

Question 11(a): Assigning the weights 2, 1 and 0 to the responses "very," "somewhat," and "slightly or not at all," respectively, the mean response was 1.9.

Question 12(a): 88 per cent said satisfactory.

Question 13(a): No one answered.

Question 15(a): The mean response was 1.25 times per month.

Question 15(b): Assigning the weights 2, 1 and 0 respectively to the responses "very helpful," "helpful" and "little or no help," the mean response was 1.54.

Question 16(a): The mean response was 95.3 per cent.

Question 16(b): The mean response was 43.

APPENDIX E

1969-1970

TITLE I CORRECTIVE PROGRAMS IN THE NON-PUBLIC SCHOOLS
QUESTIONNAIRE TO PRINCIPALS
CORRECTIVE MATHEMATICS PROGRAM

Date Number of Pupils in Corrective Mathematics Program

PLEASE RESPOND ANONYMOUSLY

1. (a) What percent of those students who qualify for admission to the corrective mathematics program are accommodated?

   (b) What special provisions, if any, are made for the others?

2. To what extent, if any, do the children miss their regular mathematics lesson in order to attend the corrective mathematics class?

   Great Some Practically no

3. About what percent of the students in the corrective mathematics program are also in some other remedial program under Title I?

4. What kind of contact have the parents had with the program? (Check each response that applies.)

   a. Two or more letters or descriptive information bulletins sent to home

   b. Two or more parents' group meetings pertaining to program

   c. Personal interviews with project teacher

   d. Personal interviews with principal or other supervisory staff members. Percent of parents involved:

      10% or less more than 10%, but less than 50% 50% or more

5. (a) How effective do you think this contact with parents has been?

   Very Somewhat Slightly or not

   (b) Please give your suggestions for improving the effectiveness of such contacts:

6. (a) Give your estimate of regular staff members' reactions to the corrective mathematics program

Enthusiastic Noncommital

Apparently pleased Dissatisfied

(b) Please add any personal comments you may have pertaining to staff reaction:

7. (a) What is the criterion for permitting students to leave the corrective mathematics program?

(b) Is this criterion for dismissing students satisfactory to you?

Yes No

(c) Give your suggestions for alternative criteria.

8. As a professional educator, please give your major suggestions for the improvement of the corrective mathematics program:

9. As a professional educator, please give a general evaluation of the corrective mathematics program.

DISCUSSION OF QUESTIONNAIRE TO PRINCIPALS

We now present an analysis of the responses to certain questions on the Questionnaire to Principals which were given to a random sample of 15 completed forms. We shall not analyze questions which call for suggestions on the part of the Principals because many of the suggestions which appeared on the approximately 100 completed forms have been incorporated into our recommendations in Part C of Chapter III.

Question 1(a): The mean response was 52.4 per cent.

Question 2: Assigning weights of 2, 1 and 0 to the responses, "great," "some" and "practically none," the mean response was 1.13.

Question 3: The mean response was 69.3 per cent.

Question 4(a): This was checked by 26.8 per cent.

Question 4(b): This was checked by 6.7 per cent.

Question 4(c): This was checked by 46.6 per cent.

Question 4(d): This was checked by 40 per cent. The answers to the question as to what per cent of parents were involved yielded a mean of 15.7 per cent.

Question 5(a): Assigning the weights 2, 1 and 0 to the responses "very," "somewhat" and "slightly or not," respectively, a mean response of 0.643 was obtained.

Question 6(a): We assigned the weights of 3, 2, 1 and 0 to the responses "enthusiastic," "pleased," "non-commital" and "dissatisfied," respectively. The mean response was 1.87.

Question 7(b): 93.3 per cent said yes. 6.7 per cent said no.

APPENDIX F

1969–1970

TITLE I CORRECTIVE PROGRAMS IN THE NON-PUBLIC SCHOOLS
QUESTIONNAIRE TO REGULAR CLASSROOM TEACHER
CORRECTIVE MATHEMATICS PROGRAM

Date Number of pupils in program Grade

PLEASE RESPOND ANONYMOUSLY

1. (a) What is the criterion for permitting students to leave the corrective mathematics program?

   (b) Is this criterion for dismissing students satisfactory?
   Yes No

   (c) Give your suggestions for alternative dismissal methods:

2. (a) In general, how much improvement have you noticed in the mathematics achievement of those students who have participated in the corrective program?
   Very much Some Practically none

   (b) If there is at least some improvement, do you attribute it primarily to the actual mathematics content which is learned in the corrective class? If not, how would you account for discernible change?

   (c) Please add any personal comments you may have:

3. To what extent, if any, do the children miss their regular mathematics lesson in order to attend the corrective mathematics class?
   Great Some Practically no

4. How would you compare the improvement in mathematics achievement of the children in the corrective program to that of the children in your class who are waiting to be assigned to the corrective class?
   Corrective children have improved much more
   Corrective children have improved somewhat more
   There are no major differences

5. In general, how has the program changed corrective students' attitude toward:

   (a) Mathematics:
   Very much Somewhat Practically none
   If change is noted, in what way?

   (b) School, in general:
   Very much Somewhat Practically none
   If change is noted, in what way?

   (c) Studying:
   Very much Somewhat Practically none
   If change is noted, in what way?

   (d) Attendance:
   Very much Somewhat Practically none
   If change is noted, in what way?

   (e) Volunteering in classroom:
   Very much Somewhat Practically none
   If change is noted, in what way?

   (f) Himself:
   Very much Somewhat Practically none
   If change is noted, in what way?

6. (a) Does there seem to be a stigma on children in the corrective mathematics class?
   Yes No

   (b) If your answer to (a) is "yes," please make suggestions for improvement:

7. In general, does the student's lost time in the regular classroom create any problems?

   (a) For him? Yes No
   Comments and/or suggestions for improvement:

   (b) For the class? Yes No
   Comments and/or suggestions for improvement:

   (c) For you? Yes No
   Comments and/or suggestions for improvement:

8. (a) Is the project teacher kept abreast of what is being taught in the regular classroom? Whose responsibility do you think it is to see that the project teacher is so informed?

   (b) Are you kept abreast of what is being taught in the corrective class? Whose responsibility do you think it is to see that you are so informed?

9. (a) Do you feel that you are on reasonably good terms with the project teacher?

   Yes No

   (b) If your answer to (a) is "No," please suggest ways which can help foster good relations:

10. As a professional educator, please give your major suggestions for the improvement of the corrective mathematics program:

11. As a professional educator, please give a general evaluation of the corrective mathematics program:

DISCUSSION OF QUESTIONNAIRE TO REGULAR CLASSROOM TEACHERS

We now present an analysis of the responses to certain questions on the Questionnaire to Regular Classroom Teachers which were given on a random sample of 15 completed forms. We shall not analyze questions which call for suggestions on the part of the regular classroom teachers because many of the suggestions which appeared on the approximately 160 completed forms have been incorporated into our recommendations in Part C of Chapter III.

Question 1(b): All answered yes.

Question 2(a): Assigning weights of 2, 1 and 0 to the responses "very much," "some" and "practically none," respectively, we found that the mean was 1.00.

Question 3: Assigning the weights 2, 1 and 0 to the responses "great," "some" and "practically no," respectively, we found that the mean response was 0.8.

Question 4: Assigning weights of 2, 1 and 0 to the responses "much more," "somewhat more" and "no differences," respectively, we found that the mean response was 0.92.

Question 5: As we indicated in Chapters I and II, the responses to all parts of this question were examined on all of the approximately 160 completed forms. Assigning weights of 2, 1 and 0 to the responses "very much," "somewhat" and "practically none," respectively, we have the following mean responses:

(a) 1.1
(b) 0.645
(c) 0.556
(d) 0.448
(e) 0.969
(f) 1.11

Question 6(a): 53.3 per cent of the 15 respondents said yes and 46.7 per cent said no.

Question 7(a): 78.5 per cent said yes and 21.5 per cent said no.

Question 7(b): 50 per cent said yes and 50 per cent said no.

Question 7(c): 86 per cent said yes and 14 per cent said no.

Question 8(a): 36.4 per cent said yes and 63.6 per cent said no.

Question 8(b): 33 per cent said yes and 67 per cent said no.

Question 9(a): 93 per cent said yes and 7 per cent said no.